Yiming Che

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PROFESSIONAL SKILLS & KNOWLEDGEasdasdas

- **Programming Languages:** Python, Matlab, R
- **Skills:** Linux, Slurm, Git, MySQL, Bash script
- **Research Interests:** Generative model, Medical imaging, Bayesian deep learning, Gaussian process, Active learning

EDUCATION BACKGROUND

- **Binghamton University, State University of New York, NY, United States**
  Department of Systems Science and Industrial Engineering
  Doctor of Philosophy in Systems Science — May 2023
  Advisor: Dr. Changqing Cheng
- **Binghamton University, State University of New York, NY, United States**
  Department of Systems Science and Industrial Engineering
  Master of Science in Industrial Engineering — May 2018
- **Capital University of Economics and Business (CUEB), Beijing, China**
  Department of Industrial Engineering
  Bachelor of Science in Industrial Engineering — July 2017

PROFESSIONAL EXPERIENCE

- **Postdoctoral Scholar at Arizona State University** (Advised by Dr. Teresa Wu) 2023-Present
  - **Weakly-supervised Brain Tumor Segmentation**
  - **Interpretable Medical Image Classification for Alzheimer's Disease**
  - **Multi-modality Fusion for Traumatic Brain Injury Diagnosis**
- **Research Assistant at Binghamton University** (Advised by Dr. Changqing Cheng) 2019-2023
  - **COVID Outbreak Prediction**
    - Physics-informed neural network (PINN) for the prediction of COVID outbreak
      - Trying to include Bayesian framework in traditional PINN for robust prediction
    - Deep Gaussian process (DGP)
      - Working on DGP with active learning for robust sequential design
  - **Surrogate Modeling and Active Learning/Sequential Design**
    - Developed a novel surrogate model which combines generalized polynomial chaos and stochastic kriging model for efficient surrogate modeling of stochastic systems
      - Significantly reduced computational budget compared to Monte Carlo simulation
      - Achieved high accuracy with much smaller computational budget compared to Monte Carlo simulation
    - Developed a new expected improvement-based sampling algorithm with Gaussian process
      - Reduced size of training set by around 90% compared to traditional one-shot design
      - Achieved high accuracy with only a small fraction of training set is used
    - Developed a K-center-based sampling algorithm with relevant vector machine

  - Significantly reduced required training data to achieve high accuracy
- Developed a batch-sampling strategy for efficient contour estimation
  - Significantly reduced training time compared to the single-sample selection strategy
  - Outperform the state-of-the-art method (weighted K-means selection)

- **Uncertainty Quantification for Machining Process**
  - Developed uncertainty quantification framework using generalized polynomial chaos expansion for machining process
    - Reduced computational budget of time-domain simulations for uncertainty quantification
    - Devised maximum entropy method for density estimation

AWARD & HONOR

- Excellence in Systems Science Research Award, Binghamton University 2023
- Graduate School Travel Grant, Binghamton University 2022
- INFORMS Bonder Foundation Award 2021
- Finalist, IISE-DAIS Mobile App Competition at 2021 IISE Annual Conference and Expo 2021
- Binghamton University Graduate Student Excellence Award in Research **(top 1%)** 2021
- Travel Grant of Midwest Dynamical Systems Conference 2019, University of Illinois at Chicago 2019
- Second Place, Best Student Paper Competition at 2019 IISE Annual Conference and Expo (Healthcare track) 2019
- Honorable Mention, Binghamton University Research Day Poster Competition, 2018 2018
- National Scholarship, Capital University of Economics and Business 2015

PUBLICATIONS

1. **Che, Y.**, Muller, J and Cheng, C. "Dispersion-enhanced sequential batch sampling for contour estimation," *Quality and Reliability Engineering International* 40 (2024): 131–144. https://doi.org/10.1002/qre.3245

2. **Che, Y.** and Cheng, C. "Physical-statistical learning towards resilience assessment for power generating systems," *Physica A: Statistical Mechanics and its Applications* 615 (2023): 128584. https://doi.org/10.1016/j.physa.2023.128584

3. Ma, Q., **Che, Y.**, Cheng, C. and Wang, Z. "Characterizations and optimization for resilient manufacturing systems with considerations of process uncertainties," *Journal of Computing and Information Science in Engineering* 23.1 (2023): 1-30. https://doi.org/10.1115/1.4055425

4. Wan, J., **Che, Y.**, Wang, Z. and Cheng, C. "Uncertainty quantification and optimal robust design for machining operations," *Journal of Computing and Information Science in Engineering* 23.1 (2023): 0110005. https://doi.org/10.1115/1.4055039

5. **Che, Y.** and Cheng, C. "Active learning and relevance vector machine in efficient estimate for basin stability of dynamic networks," *Chaos: An Interdisciplinary Journal of Nonlinear Science* 31.5 (2021): 053129. https://doi.org/10.1063/5.0044899.

6. **Che, Y.**, Guo, Z. and Cheng, C. "Generalized polynomial chaos-informed efficient stochastic Kriging," *Journal of Computational Physics* 445 (2021): 110598. https://doi.org/10.1016/j.jcp.2021.110598.

7. Wu, X., Zheng, Y., **Che, Y.** and Cheng, C. "Pattern recognition and automatic identification of early-stage atrial fibrillation," *Expert Systems with Applications* 158 (2020): 113560. https://doi.org/10.1016/j.eswa.2020.113560.

8. **Che, Y.**, Cheng, C., Liu, Z. and Zhang, Z. "Fast basin stability estimation for dynamic systems under large perturbations with sequential support vector machine," *Physica D: Nonlinear Phenomena* 405 (2020): 132381. https://doi.org/10.1016/j.physd.2020.132381.

9. **Che, Y.**, Liu, J. and Cheng, C. "Multi-fidelity modeling in sequential design for identification of stability region in dynamic time-delay systems," *Chaos: An Interdisciplinary Journal of Nonlinear Science* 29.9 (2019): 093-105. https://doi.org/10.1063/1.5097934.

10. **Che, Y.** and Cheng, C. "Uncertainty quantification in stability analysis of chaotic systems with discrete delays," *Chaos, Solitons & Fractals* 116 (2018): 208-214. https://doi.org/10.1016/j.chaos.2018.08.024.

PROFESSIONAL SERVICES

- Reviewer 2022-present
  - Physica D: Nonlinear Phenomena
  - International Conference on Automation Science and Engineering
- Student member, Student leadership board at IISE Mar. 2021-2022
- Vice president, ASQ Binghamton chapter Aug. 2019-2022